

What is claimed is:

Subpart 1.

1. A hyperlinked broadcast system comprising:
  - a video source;
  - a video encoder in communication with said video source, said video encoder producing a transport stream;
  - an annotation source;
  - a data packet stream generator in communication with said annotation source and said video encoder, said data packet stream generator producing encoded data packets; and
  - a multiplexer system in communication with said video encoder and said data packet stream generator, said multiplexer generating a digital broadcast signal comprising an augmented transport stream from said transport stream and said encoded data packets,

wherein said video encoder provides timing information to said data packet stream generator and said data packet stream generator synchronizes annotation data from said annotation source with a video signal from said video source in response to said timing information.
2. The system of claim 1 wherein said timing information comprises one of timestamp information, timecode information, frame numbering information and global time of day.
3. The system of claim 1 wherein said annotation data comprises mask data and at least one of textual data and graphics data.
4. The system of claim 3 wherein said mask data includes location information of an object in an annotated video frame.

5. The system of claim 4 wherein said location information includes a graphics location reference that represents a fixed relation to a set of pixels associated with said object.
6. The system of claim 5 wherein said graphics location reference includes an upper left most pixel in said associated pixel set.
7. The system of claim 5 wherein said graphics location reference includes a centroid pixel of said associated pixel set.
8. The system of claim 3 wherein said mask data comprises location and shape information of an object in a video frame to be annotated.
9. The system of claim 8 wherein said shape information is represented by a graphical overlay of said object.
10. The system of claim 8 wherein said shape information is represented by an outline of said object.
11. The system of claim 8 wherein said shape information is represented by a mathematical representation of a set of pixels associated with said object.
12. A hyperlinked broadcast and reception system comprising:
  - a video source;
  - a video encoder in communication with said video source, said video encoder producing a transport stream;
  - an annotation source;
  - a data packet stream generator in communication with said annotation source and said video encoder, said data packet stream generator producing encoded data packets;

a multiplexer system in communication with said video encoder and said data packet stream generator, said multiplexer generating a digital broadcast signal comprising an augmented transport stream from said transport stream and said encoded data packets;

a broadcast channel in communication with said multiplexer system;

a receiver in communication with said broadcast channel; and

a display device in communication with said receiver,

wherein said video encoder provides timing information to said data packet stream generator and said data packet stream generator synchronizes annotation data from said annotation source with a video signal from said video source in response to said timing information, and

wherein said display device displays said annotation data associated with said video signal in response to a viewer request on a frame by frame basis.

13. The system of claim 12 wherein said timing information comprises one of timestamp information, timecode information, frame numbering information and global time of day.

14. The system of claim 12, wherein said annotation data comprises mask data and at least one of textual data and graphics data.

15. The system of claim 14, wherein said mask data and said at least one of textual data and graphics data are transmitted over separate streams in said broadcast channel.

16. The system of claim 14 wherein said mask data comprises location information of an object in an annotated video frame.

17. The system of claim 16 wherein said mask data further comprises shape information of an object in an annotated video frame.

18. The system of claim 12 wherein said timing information is employed to synchronize the display of annotation data from said annotation source with said video signal from said video source.

19. The system of claim 18 wherein said timing information comprises one of timestamp information, timecode information, frame numbering information and global time of day.

20. The system of claim 12 wherein said system transmits information related to said viewer request to a remote location over a backchannel communications channel.

21. The system of claim 20 wherein said backchannel communications channel is a store-and-forward channel.

22. The system of claim 12, wherein said annotation data comprises information regarding goods and services for sale.

23. The system of claim 12, wherein said annotation data comprises non-commercial information.

24. A hyperlinked reception system comprising:  
a receiver in communication with a broadcast channel; and  
a display device in communication with said receiver,  
wherein said receiver decodes a digital broadcast signal to recover a video signal and annotation data; and  
wherein, in response to a viewer request, said display device displays said annotation data associated with said video signal on a frame by frame basis.

25. The system of claim 24 wherein timing information is employed to synchronize a display of said annotation data with said video signal.

26. The system of claim 25 wherein said timing information comprises one of timestamp information, timecode information, frame numbering information and global time of day.

27. The system of claim 25 wherein said receiver synchronizes said annotation data with said video signal in response to said timing information.

28. The system of claim 24 wherein said annotation data comprises a plurality of annotations having equal timing information, and said viewer request comprises an indication as to which annotation of said plurality of annotations is to be displayed.

29. A hyperlinked reception system comprising:  
a receiver in communication with a broadcast channel; and  
a display device in communication with said receiver,  
wherein said display device displays annotation data associated with a video signal, in response to a viewer request, on a frame by frame basis, said annotation data being associated with said video signal in response to timing information.

30. The system of claim 29 wherein said timing information comprises one of timestamp information, timecode information, frame numbering information and global time of day.

31. A method of generating a hyperlinked video signal, comprising:  
providing a source video;  
encoding said source video with a video encoder to produce a transport stream and timing information;  
providing a source of annotation data;  
communicating said transport stream and timing information from said video encoder and said annotation data from said source of annotation data to a data packet stream generator, said data packet stream generator synchronizing said annotation

data with a video signal from said video source in response to said timing information and producing encoded data packets.

32. The method of claim 31 wherein said timing information comprises one of timestamp information, timecode information, frame numbering information and global time of day.

33. The method of claim 31, wherein said annotation data comprises information regarding goods and services for sale.

34. The method of claim 31, wherein said annotation data comprises non-commercial information.

35. The method of claim 31 wherein said annotation data comprises mask data and at least one of textual data and graphics data.

36. The method of claim 35 wherein said mask data includes location information of an object in an annotated video frame.

37. The method of claim 36 wherein said location information includes a graphics location reference that represents a fixed relation to a set of pixels associated with said object.

38. The method of claim 37 wherein said graphics location reference includes an upper left most pixel in said associated pixel set.

39. The method of claim 38 wherein said graphics location reference includes a centroid pixel of said associated pixel set.

40. The method of claim 35 wherein said mask data comprises location and shape information of an object in an annotated video frame.

41. The method of claim 40 wherein said shape information is represented by a graphical overlay of said object.

42. The method of claim 40 wherein said shape information is represented by an outline of said object.

43. The method of claim 40 wherein said shape information is represented by a mathematical representation of a set of pixels associated with said object.

44. The method of claim 31, further comprising:  
communicating said transport stream and said encoded data packets to a multiplexer system, said multiplexer system generating a hyperlinked digital broadcast signal comprising an augmented transport stream from said transport stream and said encoded data packets.

45. The method of claim 44 wherein said annotation data comprises mask data and at least one of textual data and graphics data and wherein said mask data and said at least one of textual data and graphics data represent separate streams contained in said hyperlinked digital broadcast signal.

46. The method of claim 44, further comprising:  
broadcasting said hyperlinked digital broadcast signal.

47. A method of viewing a hyperlinked video signal, comprising:  
receiving a hyperlinked video signal comprising an augmented transport stream;  
demultiplexing said augmented transport stream to recover a transport stream and encoded data packets;  
displaying said transport stream framewise as a video on a display;  
decoding said data packets to recover annotation data and timing information;

synchronizing said annotation data with said video using said timing information;  
and  
in response to a viewer request, displaying said annotation data on said display on  
a frame by frame basis.

48. The method of claim 47 wherein said timing information comprises one of  
timestamp information, timecode information, frame numbering information and global  
time of day.

49. The method of claim 47, further comprising  
transmitting information related to said viewer request to a remote location over a  
backchannel communications channel.

50. The method of claim 47, further comprising:  
in response to a viewer prompt, accepting from a viewer information regarding a  
commercial transaction, and completing said transaction.

51. The method of claim 50, wherein the information regarding a commercial  
transaction accepted from a viewer comprises at least one of a viewer's identifier, a  
viewer's address, an identifier of a viewer's financial account, a viewer's password, a  
viewer's personal identification number, a quantity, a model, a size, a color, a descriptor  
of a good or service to be vended, and a price.